Math 30-1   Name: _____

Permutations: Fundamental Counting Principle

1. The football team has the following options for uniforms

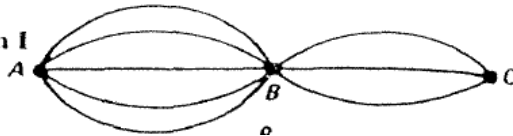| Jersey	Green or gold
Pants	Black or white or green
Socks	Black or green

If the team plays in a different uniform each week, how many weeks can it play before there is a repeat?

2. With the renovations complete at LCHS there are 8 entrances. If you are coming to school how many ways can a student enter and exit
    a. through a different entrance

    b. through any entrance

    c. the same entrance

3. How many ways can you get from Point A to Point C in the diagrams below, if you can pass through each point at most once?
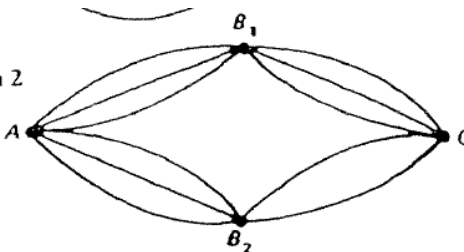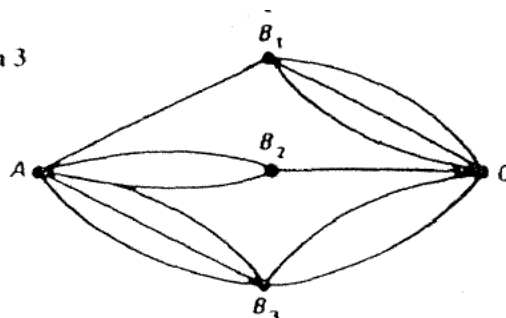   a.

Diagram I

    b.

Diagram 2

    c.

Diagram 3

4. In a class of 35 students how many ways are there of awarding,
    a. In math, a first, second and third prize

    b. A math prize, a chemistry prize and a humanities prize.

5. Find the number of 4-letter "WORDS" can be formed from the letters in the word PRODUCE, if each letter can only be used once

    a. No restrictions

    b. Only consonants

    c. Begin and end with a consonant

    d. Begin with a vowel

    e. Contain the letter P

    f. Begin with a D and end with a vowel

6. Given the DIGITS

    a. 1, 5, and 9; how many 3 digit numbers can be made if there are no repeats

    b. 1, 3, 5, 7 and 9; how many 3 digit numbers can be made if repeats are allowed

    c. 0, 2, and 3; how many 4 digit numbers if repeats are allowed

    d. 0, 1, 2, and 3; how many numbers can be made if repeats are not allowed

7. Mr. and Mrs. Wren want a family picture with their children Henry, Bella and Sawyer. If there are in straight line, how many ways can they line up if
   a. There are no restrictions

   b. The parents are together at either end of the line

   c. Bella has to be in the middle

   d. The children alternate with the adults

8. Free Lunch Friday Combo

Main	Dessert	Drink	Snack
Hamburger Hot Dog	Ice cream Sandwich Pie Cake	Pop Juice Milk Water	Chips Chocolate Bar

   a. If you pick one thing from each category, how many possible lunch options are there?

   b. If you have to take a minimum of one thing but you can take up to one thing from each category, how many possible lunch options are there?